CLAIMS:

1. A method for sequentially injecting a molten material comprising:

clamping a stationary platen and a movable platen at a clamping force to define at least two mold cavities;

injecting a molten material into a first mold cavity at a fill rate to fill and pack said cavity with said molten material;

holding molten material in said first mold cavity;

injecting molten material into a second mold cavity to fill and pack said cavity with said molten material; and

holding molten material in said second mold cavity.

2. The method of claim 1 wherein molten material is held in said mold cavities at said clamping pressure until said material cools and solidifies into molded articles.

3. The method of claim 1 wherein a hydraulic cylinder, toggle, or electric machine is used to clamp the stationary platen and the movable platen at said clamping force.

4. The method of claim 1 wherein a valve gate faces each of said mold cavities.

5. The method of claim 4 wherein the valve gates are controlled independently of each other by a control unit.

6. The method of claim 1 wherein the amount of molten material injected into said cavity is monitored by a control unit that receives signals from a stroke sensor associated with a resin feeding screw.

7. The method of claim 1 wherein the mold cavities are multi-gate mold cavities.

8. The method of claim 5 wherein the control unit starts and holds injection of molten material into said cavities based on signals transmitted by said stroke sensor or a timer or pressure switch to the control unit.

9. The method of claim 1 wherein the flow rate of injection of said molten material is reduced from a filling flow rate when molten material in said first cavity reaches a velocity to pressure switchover point and is then increased to the filling flow rate when said second mold cavity is injected with said molten material.

10. The method of claim 4 wherein said valve gate is closed when said molten material in said cavity reaches a velocity to pressure switchover point.

11. The method of claim 4 wherein said valve gate is closed when said molten material in said cavity has been held at a holding pressure for a period of time.

12. The method of claim 1 wherein no holding pressure is used during said steps of holding molten material inside said first and second cavities.

13. An injection molding apparatus comprising:

a mold having at least two mold cavities;

an molten material inlet system in communication with said at least two mold cavities;

at least two valves in said molten material inlet, wherein each of said at least two valves are associated with one of said mold cavities; and

a controller adapted to sequentially inject molten material into said mold cavities.

14. The apparatus of claim 11 wherein the mold cavities are multi-gate mold cavities.

15. The apparatus of claim 11 further comprising a stationary platen and a movable platen adapted to apply a clamping pressure to said mold having said at least two mold cavities.

16. The apparatus of claim 11 wherein said molten material inlet comprises at least two channels, each of said channels associated with one of said mold cavities, each of said channels in communication with and branching from a common inlet.

17. The apparatus of claim 16 wherein each of said channels includes a valve gate.

18. The apparatus of claim 11 wherein a valve gate is associated with each of said inlets.

19. The apparatus of claim 11 further comprising a clamping system, said clamping system applying a clamping pressure to said mold.

20. The apparatus of claim 19 wherein said clamping pressure is lower than the pressure that would be required by a non-sequential controller.

21. A controller for use with an injection molding device having a mold with at least two cavities, the controller comprising:

means for initiating a flow of molten material into a first mold cavity;

means for reducing flow of molten material into said first mold cavity when said first mold cavity is filled with molten material;;

means for initiating a flow of molten material into a second mold cavity; and

means for reducing flow of molten material into said second mold cavity when said second mold cavity is filled with molten material.

22. The controller of claim 21, wherein said means for initiating and reducing flow of molten material is responsive to a stroke sensor associated with a

resin feeding screw, a timer or a pressure transducer associated with the first mold cavity and the second mold cavity.

23. The controller of claim 21, wherein said mold cavities are multi-gate mold cavities.

24. The controller of claim 21 wherein the flow of molten material into said first and second mold cavities is reduced when said first or second mold cavity is filled with molten material and said molten material is held inside said cavity at a holding pressure for a period of time.

25. A method for injection molding articles comprising:

a) providing an injection molding machine with a plurality of mold cavities;

b) injecting a molten material into a first mold cavity at a fill rate until the first mold cavity is filled with molten material or until the molten material inside said first mold cavity reaches a set-point holding pressure;

c) injecting said molten material into a second mold cavity at a fill rate until the second mold cavity is filled with molten material or until the molten material inside said second mold cavity reaches a set-point holding pressure;

d) repeating steps b)-c) until all of said plurality of mold cavities are filled with said molten material or are at the set-point holding pressure;

e) holding said molten material at said set-point pressure inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and

f) ejecting said molded articles from said injection molding machine.

26. The method of claim 25 wherein molten material is held in said mold cavities at a clamping pressure until said material cools and solidifies into molded articles.

27. The method of claim 25 wherein a valve gate faces at least one of said plurality of mold cavities.

28. The method of claim 27 wherein the valve gates are controlled independently of each other by a control unit.

29. The method of claim 25 wherein the pressure inside the mold cavities is measured by pressure transducers associated with said cavities.

30. The method of claim 25 wherein said fill rate is measured by a stroke sensor associated with a resin feeding screw.

31. The method of claim 25 wherein the mold cavities have multiple inlets.

32. The method of claim 28 wherein the control unit starts and holds injection of molten material into said cavities based on signals transmitted by one or both a stroke sensor or pressure transducers.

33. The method of claim 25 wherein said molten material is injected into said plurality of mold cavities by a resin feeding screw.

34. The method of claim 25, wherein the fill rate of injection of said molten material is reduced from a filling flow rate when molten material in said first cavity is full or reaches a holding pressure and is then increased to the filling flow rate when said second mold cavity is injected with said molten material.

35. A method for injection molding articles comprising:

a) providing an injection molding machine with a plurality of mold cavities and a resin feeding screw;

b) injecting a molten material into a first mold cavity at a fill rate until said first mold cavity approaches a velocity to pressure switchover point;

c) injecting said molten material into a second mold cavity at a fill rate until the second mold cavity approaches a velocity to pressure switchover point;

d) repeating steps b)-c) until all of said plurality of mold cavities are filled with said molten material;

e) holding said molten material inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and

f) ejecting said molded articles from said injection molding machine.

36. The method of claim 35 wherein said molten material is injected into said plurality of mold cavities using said resin feeding screw.

37. The method of claim 35 wherein prior to said step of injecting said molten material into a second mold cavity, a valve gate associated with said second mold cavity is opened.

38. The method of claim 36 wherein said resin feeding screw is activated within about 0.5 seconds after opening said valve gate.

39. A method for injection molding articles comprising:

a) providing an injection molding machine with a plurality of mold cavities and a resin feeding screw;

b) injecting a molten material into a first mold cavity at a fill rate until said first mold cavity is filled and said molten material is held at a holding pressure for a period of time;

c) closing said first mold cavity;

d) opening a second mold cavity;

e) injecting said molten material into said second mold cavity at a fill rate until the second mold cavity is filled and said molten material is held at a holding pressure for a period of time;

f) closing said second mold cavity;

g) repeating steps b)-f) until all of said plurality of mold cavities are filled with said molten material;

h) holding said molten material inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and

i) ejecting said molded articles from said injection molding machine or a pressure switch.

40. The method of claim 39 wherein said molten material is injected into said plurality of mold cavities using said resin feeding screw.

41. The method of claim 40 wherein said resin feeding screw is activated within about 0.5 seconds after opening said second mold cavity.

42. A method for injection molding articles comprising:

a) providing an injection molding machine with a plurality of mold cavities and a resin feeding screw in a starting position;

b) injecting a molten material into a first mold cavity at a fill rate until said first mold cavity approaches a velocity to pressure switchover point, wherein said resin feeding screw is at an ending position at said switchover point;

c) moving said resin feeding screw back to said starting position;

d) injecting said molten material into a second mold cavity at a fill rate until the second mold cavity approaches a velocity to pressure switchover point, wherein said resin feeding screw is at said ending position at said switchover point;

e) moving said resin feeding screw back to said starting position;

f) repeating steps b)-e) until all of said plurality of mold cavities are filled with said molten material;

g) holding said molten material inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and

h) ejecting said molded articles from said injection molding machine.